dislocate the mass of fat more easily than it sometimes displaces the spleen, to give a tympanitic note over the otherwise dull area. Naturally, if tympany obscured the splenic area from day to day no further data regarding the spleen could be collected.

LITERATURE.

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E. Hodenpyl. A Case of Apparent Absence of the Spleen, with General Compensatory Lymphatic Hyperplasia. Proc. New York Path. Soc. (1897-98), 1899, p. 185.

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Hodenpyl's article collects most of the literature. All of the remaining literature may be found in the Index Catalogue of the Library of the Surgeon-General's Office.

TORSION OF THE GREAT OMENTUM.

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INTRODUCTION. In the first volume of the *Annals of Surgery*, pp. 405–430, published in 1900, Mr. Lawford Knaggs, of Leeds, drew attention to the occurrence of volvulus or torsion of the intestine associated with a hernia. His interest had been drawn to the subject by two cases which occurred in his private practice. Both examples presented well-marked signs and symptoms of the curious condition present, so that it could not be overlooked. In the accounts of other examples which are given it is noteworthy that a very large number were fatal. The evolution of our knowledge of any disease is almost always the same. The severe and fatal forms first attract attention; later, other and milder clinical manifestations are recognized; and, finally, given the necessary circumstances (such as the presence of a hernia, as in this example), the condition is recognized as occurring frequently. Mr. Lawford Knaggs' paper is really an introduction of the subject from the period of rarity to the middle stage. As yet it has not advanced to the third or "frequent" stage. Though only writing on a kindred subject, torsion of the omentum and not of the bowel, we must express our opinion that volvulus is a very common consequence of the strangulation of a hernia. When the strangulation is at the hernial orifice, this becomes the fixed point about which the protruded loop of bowel twists. The twisting agents are, firstly, the meteorism in the strangulated coil; and, secondly, the movements of flexion of the thigh.

If the strangulation is not tight, the point on which the bowel has twisted may be carried within the abdomen by the force of the twist, when the intestinal obstruction becomes intra-abdominal. Should the hernia alone be operated on, and the volvulus not be reduced spontaneously, as will occur very easily when the twisted coil is set free from the hernia, the patient will die of unrelieved obstruction. These cases are rare, and naturally will continue so, because in strangulation of the bowel the volvulus is secondary and makes a previously slight obstruction absolute. As an example of this, reference is made to a case recorded in the Erasmus Wilson *Lectures*, 1904, pp. 58–60, in which a volvulus was noted. It is a matter of common surgical knowledge that in the strangulation of a hernia the situation of the obstruction is at the hernial orifice. If there is torsion of the bowel it will probably be intrahernial, and very rarely intra-abdominal. The volvulus is undone after the reduction of the bowel by the presence of the gas within it. But if surgeons will take the trouble to look carefully, volvulus of the gut within the hernia will be found a common, if not a very common, occurrence, but it is of little or no practical import—just as the torsion, which can be seen accompanying almost every internal form of intestinal obstruction if looked for, requires no special treatment. Torsion of the bowel in strangulated, obstructed, or painful and irreducible herniæ is far from an uncommon event. What, then, with regard to the omentum which is often alone or sometimes accompanies the bowel? Before entering upon the subject-matter of this paper reference must be made to another structure, besides bowel and omentum, which descends through the inguinal canal into the scrotum. This organ is the testis. The twists found in structures which have passed through this region are formed slowly by the addition of frequent small increments. The acute volvulus of the bowel in strangulated herniæ is an exception. Normally, the testis is in the scrotum by the eighth or ninth month of intrauterine life. Imperfectly descended testes accompany the majority of the recognized cases of torsion of the cord, and are in the situation to become twisted by the movements of the trunk and legs. A careful examination of imperfectly descended testes showed that small degrees of torsion, half a complete turn, were commonly found in cases which had suffered from sudden and sharp attacks of pain in the gland. Attacks of pain in an imperfectly descended testis were given a marked significance by this fact.

Both bowel and imperfectly descended testes in the inguinal region are often twisted. We should expect the omentum which is exposed to similar conditions when in a hernia, to suffer likewise. With the object of introducing this, and of collecting all that is known on the subject within reasonable compass and in an accessible form, the authors have written this paper. No cases beyond the end of 1904 have been included.

HISTORY. The first example of torsion of the omentum, described by Oberst in the year 1882, was found in the sac of a painful irreducible inguinal hernia of old standing in a man aged thirty-five years. From this date to the year 1893, when Demons described an example, no other case was recorded. In 1898 3 new examples were added, 1 being added by each of the following: Bayer, Eiselberg, and Monod; 10 more were published in 1900; 6 more in 1901, and 5 more in 1902. In 1903 a large number of new instances were described, 16 in number. Up to the end of 1904 only 7 more have been added. Four new ones are recorded in this paper, thus bringing the total number up to 53. The fact that the first instance was described in 1882 cannot be urged in favor of a new pathological condition occurring then for the first time. Neither can the fact that no cases are described in 1890 and 16 in 1903 be attributed to such a condition as that represented by the phrase "good and bad harvests." The most intelligible explanation of the history of the disease is that, although it had occurred for centuries and perhaps thousands of years, the condition was first *observed* by Oberst in 1882. For the next eleven years it continued to be overlooked, until in 1893 Demons rediscovered it. The seeds sown by these authors did not bear fruit until 1898; and though 1899 was barren in this regard, the next year bore full fruit, 10 cases. Since then surgeons have begun to notice the condition, and by the end of 1904 53 cases in all are known.

A further point is of interest—viz., that Lucas-Championnière (observations 15 and 17) was the first to report more than 1 case. Yet it cannot be held that he is the only man who up to 1901 had seen 2 cases. To him must be given the credit of being the first to *recognize* 2 of his own. Nordman (observations 28 and 29) in 1903 reported 2 cases, and Rudolph in the same year reported 4 others, and to him belongs the credit of observing the largest number of cases and publishing the longest contribution to the subject (observations 30 to 33). Mauclaire in 1904 published 2 cases (46 and 47), and the authors of this paper now add 4 more (50 to 53).

History teaches us, also, that only the most obvious cases were recognized. And although we know that intra-abdominal torsion of the omentum must be infrequent, torsion of it within the sac of a strangulated or painful and irreducible epiplocele is a fairly common event. Both the history of the reported cases and our own observations bear out this suggestion. To exemplify how these cases may have been mistaken or overlooked we have included a section on the Inferential Diagnosis.

CLINICAL CLASSIFICATION. The cases of torsion of the omentum naturally fall into three main clinical groups:

1. *Abdominal.* In this type there is no hernia present and the torsion is purely abdominal. There are 6 examples: Baldwin (22),

Syme (23), Stewart (43), Noble (45), Scudder (48), Corner and Pinches (51).

2. *Hernial.* The torsion occurs solely within the sac. There are 6 examples: Oberst (1), Heinlein (26), Rudolph (31), Capette (38), Corner and Pinches (52 and 53).

3. *Hernial and Abdominal.* The torsion is not limited to the hernial sac, but extends into the abdomen, or there may be a series of twists in each. The remaining 41 cases belong to this variety. Two subdivisions may be recognized:

1. When a hernial tumor is present, 30 cases.
2. When the hernial sac is empty the usual contents being reduced into the abdomen, 11 cases.

Cases of the second class, the hernial, are the ones most easily overlooked and will be found, we believe, to be the most frequent.

CLINICAL DIAGNOSIS MADE IN THE REPORTED CASES. 1. *Abdominal.* Of these 6 cases, 5 were diagnosticated as appendicitis, probably accompanied by a local abscess; the other as a suppurating omental hydatid.

2. *Hernial.* Strangulated hernia was the diagnosis made in 4 cases, irreducible hernia in 1, and incarcerated hernia in the other.

3. *Hernial and Abdominal.* In this large group the following diagnoses were made:

Strangulated inguinal hernia	14 cases.
Incarcerated " "	1 case.
Irreducible " "	2 cases.
"Inguinal hernia"? condition	2 "
Strangulated umbilical hernia	1 case.
Reduction of hernia *en masse*	2 cases.
Sarcoma of testicle	1 case.
Appendicitis	9 cases.
Intestinal obstruction	1 case.
Abdominal tumor	1 "
Intraperitoneal abscess	1 "
Chronic peritonitis	1 "
Torsion of omentum	1 "

In 4 cases no diagnosis was made. The diagnosis of torsion of the omentum was made once, by Rudolph (32).

CLINICAL ETIOLOGY. *Sex.* Torsion of the omentum occurs more frequently in males than in females. Of the 53 recorded cases, 36 were males, 17 females. Males, 67.92 per cent.; females, 32.07 per cent.

During the years 1898–1902 inclusively, the number of cases of inguinal hernia admitted to St. Thomas' Hospital was 1080; of these 951 were males, 129 females; about 8 to 1. In this same period there were 191 strangulated inguinal herniæ, of which 184 were males, 7 females; about 26 to 1. The presence of a strangulated inguinal hernia in a woman should raise the suspicion of the presence of a uterine appendage or twisted omentum in the sac.

Age.	No. of cases.		
0 to 10 years	0		
11 " 20 "	1	=	1.88 per cent.
21 " 30 "	5	=	9.4 "
31 " 40 "	14	=	26.4 "
41 " 50 "	20	=	37.7 "
61 " 70 "	0		
71 " 80 "	1	=	1.88 "
Not recorded	3	=	5.6 "

The most frequent period for the torsion to occur is middle life, from thirty-five to fifty-five years of age; 39 cases, 78 per cent., occurred during that period. The youngest recorded example was seventeen (Chavannaz, 10). The oldest was seventy-nine (Wiener, 9).

Hernia. With the exception of the 6 purely abdominal cases, a hernia was present in every instance, 90 per cent. The various forms of herniæ present were as follows:

Right inguinal	33 cases	=	70.2 per cent.
Left "	9 "	=	19.1 "
? side "	3 "	=	6.38 "
Ventral	1 case	=	2.1 "
Umbilical	1 "	=	2.1 "

In no case was there a femoral hernia present.

These ruptures had been previously reducible, with the exception of 3: L. Championnière and Mauban (17), Weisinger (16), Heitz and Bender (11), Makins (50).

In 4 cases the hernia had been present between one and five years, 5 cases between six and ten years, 8 cases between eleven and fifteen years, 4 cases between sixteen and twenty years, and 6 cases between twenty-one and thirty years. The hernia is commonly one of long standing, 33 per cent. having been present under ten years, 45 per cent. between ten and twenty years, and 22 per cent. between twenty and thirty years.

THE PREVIOUS HISTORY OF THE CASES. In only 16 of these instances is there any reference to a previous illness at all referable to the omental torsion. Of these 16, 9 occurred in 1903 and 1904; so that it is possible, nay, probable, that the previous history had been overlooked. The past histories in 12 of these cases are as follows:

Case 1. Wiener (9). Four weeks before the acute attack the patient had a sudden attack of severe pain in the right iliac region, which lasted twenty-four hours and then subsided.

Case 2. Nordmann (28). For several weeks the patient had suffered from gastric disturbances accompanied by abdominal pain.

Case 3. Malherbe (41). For two years before the operation the patient suffered from attacks of pain in the right inguinal region, with vomiting. During this period there were five attacks, each terminating when the hernia was reduced.

Case 4. Vignard (40). For nine years before the operation there were attacks of pain in the right side of the abdomen, which lasted four to five days. There were four or five attacks each year.

Case 6. Audier (44). There had been several attacks resembling intestinal obstruction.

Case 7. Noble (45). For two years before operation, at irregular intervals, the patient had attacks of sudden pain in the abdomen, attended by nausea and vomiting.

Case 8. Corner and Pinches (51). History of several attacks of pain and discomfort in the right side of the abdomen, not severe enough to cause the patient to take to her bed.

Case 9 and 10. Corner and Pinches (52 and 53). Both men had had attacks of pain in their herniæ, but none so severe as those for which they were operated on.

Case 11. Trinkler (49). There was a history of previous attacks of abdominal pain.

Case 12. Makins (50). She had suffered from several attacks of pain in the hernia, sometimes accompanied by sickness.

The other examples are recorded by Hochenegg (8), Championnière (15), Quenu (29), and Morrison (39).

It is most important that the significance of previous crises or attacks of pain in the hernia or in the abdomen should be recognized. These may have been produced by colic, appendicitis, or some such condition, quite unconnected with the omental twists. But many twists, sometimes ten, are frequently found. These have been formed by slow increments of the torsion. It is tempting and not irrational to refer the previous attacks of pain to some of the increments being greater or more forcible than the others. This is borne out with regard to the testis; for instance, the more acute increase of torsion, which caused the attack of pain, has been untwisted, giving perfect relief. A similar suggestion with regard to the previous history has been strongly urged in connection with volvulus of the cæcum in a recent paper.[1] Future observers will gain much in paying more attention to the history of cases of this nature.

If this surmise is correct—that these attacks, or some of them, are produced by increased twists, although only the more severe cases are yet recognized—the previous history of the patients illustrates the clinical history of milder examples, due to subacute and chronic torsion of the omentum and hitherto unrecognized. It may be expected confidently that the observations in future will tend to make the occurrence of omental torsion more frequent, just as in the cases of torsions of the bowel and of the testis.

Clinical Symptoms. *Onset.* In only a few of these cases is any reference made to the onset of symptoms. In 21 cases, 37.7 per cent., the onset was sudden, and in seven, 13.2 per cent., gradual. In the purely abdominal cases sudden onset was noted four times, gradual once. Below are given some examples of the method of onset.

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[1] Corner and Sargent. St. Thomas' Hospital Reports, 1903, pp. 407–420; and Annals of Surgery, January, 1905.

Monod (5). Immediately after an effort, the patient felt a sharp pain in the right iliac fossa, the pain being likened to a cut with a knife.

Noble (45). Sudden onset with excruciating pain in the abdomen, attended by nausea and vomiting.

Malherbe (41). Four hours after a meal sudden violent pain in the right iliac fossa, most intense at McBurney's point.

Corner and Pinches (51). The patient had been ill for ten days with pain in the right side.

Broca and Chavannaz (10). Suddenly one morning an irreducible tumor appeared in the right inguinal region, without any signs of strangulation being present.

Scudder (48). Sudden onset with abdominal pain and vomiting.

Pain. Pain is the most constant of all the symptoms, and in nearly all the cases where any details are given pain is said to be present, and is one of the first symptoms to appear. In investigating this symptom it will be best to divide the cases into three types:

1. *Abdominal.* Pain in the abdomen was present in all these cases; in 4 it was situated in the right iliac fossa, and in one it is said to have been diffuse but most intense at McBurney's point.
2. *Hernial.* In 4 cases pain is noted as being present in the hernia.
3. *Abdominal and Hernial.*

TABLE SHOWING THE SITE TO WHICH THE PAIN WAS REFERRED IN THESE CASES.

Pain referred to hernia alone	14 cases.
" " abdomen alone	17 "
" " both	7 "
Pain not mentioned in any particular region	3 "

In 11 cases the pain is especially referred to the right iliac fossa, and in 1 is said to be most intense at McBurney's point. As a rule it is very acute and persistent, but in 1 case (Morrison, 39) there were exacerbations of pain from time to time. In most cases it was sufficiently severe to cause the patient to take to his bed.

Vomiting does not appear to be a very constant symptom; in 19 cases, 35.8 per cent., it is said to have been present; in 14, 26.4 per cent., the absence of vomiting is noted; and in 20, 37.7 per cent., no mention of vomiting is made. Where it has been noted it is usually frequent and violent. In 1 case (Lejars) it is noted that the vomited matter was greenish. Nausea without vomiting was noted in 9.4 per cent of cases.

Bowels. Condition of the Bowels. Diarrhœa in 2 cases; bowels open in 16 cases; bowels inactive in 11 cases; flatus alone passed in 5 cases.

From the above table it will be seen that the most commonly recorded condition is that the bowels were open; but this term is a vague one. In the majority of cases it is not stated on what day of the disease they were opened, or how often. Absolute "obstruction" is noted five times and the passage of flatus alone in 5 instances. On the whole the condition of the bowels seems very variable, but the most common condition is one of inactivity.

Pulse. As a rule the pulse is accelerated, varying from 80 up to 120 per minute.

Temperature. The temperature is usually slightly raised; in 21 cases, 39.6 per cent., it is noted that the temperature was above normal; in only 3 is it said to have unchanged. The highest recorded temperature is 101.8°; the usual is between 100.4° and 101.4°. In no case is it said to have been subnormal.

CLINICAL SIGNS. *Tumor.* In all but 3 of these patients a tumor could be felt on examination, but its situation varied.

1. *Abdominal.* In 4 of these a mass could be felt in the right iliac fossa; in the other 2 there was tenderness and rigidity in this region, but no definite tumor could be detected on palpation.

2. *Hernial.* All of these patients had a hard, painful, irreducible swelling in the inguinal region.

3. *Hernial and Abdominal.* The following summary shows the tumor present in this series:

Situation of Tumor: A hernial tumor alone present, 12 cases; an abdominal tumor alone present, 7 cases; tumors present in both situations, 19 cases; neither tumor detected, 3 cases.

From this it will be seen that it is most common for a tumor to be present both in the hernia and in the abdomen, and it is very frequently noted that the hernial and abdominal tumors appear to be continuous.

The tumor is, as a rule, hard, tender on palpation, dull to light rather than to heavy percussion, and is often said to have had an irregular surface. Dulness was noted nineteen times in this series. General distention of the abdomen is not a common sign; it was only noted seven times, 13.2 per cent.

PROGNOSIS. All of the cases recovered except 8. The fatal ones were recorded by Eiselberg (4), Monod (5), Heitz and Bender (11), Lejars (14), Moresco (25), Tremolière (34), Zeller (37) and Audier (44). Of these Tremolière's was too bad for anything to be done; Audier's was operated on as a desperate measure; Monod's and Heitz and Bender's died of pneumonia, and Lejars' of delirium tremens. Zeller's record is so short that nothing can be said. Eiselberg's case died thirty-eight hours after operation, presumably of peritonitis. These results show that when submitted early to operation the prognosis is good.

The mortality for these 53 cases, in which the majority of observers recognized the pathological condition of torsion of the omentum for the first time, is 13.2 per cent. But if the cases in which the fatal result was not concerned with the surgeon are excluded, the percentage mortality is 4.1; there are very few conditions which can show so small a mortality in the first chapter of their history.

INFERENTIAL DIAGNOSIS. All diagnosis is inferential: the conclusion is arrived at by means of inferences drawn from observations. These inferences can only be deduced correctly when born of sound knowledge. From the previous part of this paper practically all that is known of torsion of the omentum can be learned. It was decided, therefore, to include a section on the inferential diagnosis, in which we will draw inferences from the cases of others and from our own. As a new disease was not discovered in the first case of omental torsion which was reported, but merely an old one recognized, this section will be interesting and instructive in affording examples in which the twists were or may have been overlooked. Further, some authors have included under the head of omental torsion cases which, after mature consideration and study of the records of all available examples, we do not feel justified in accepting on the evidence adduced. The first three and the fifth instance to be quoted are examples of this.

To begin with, we will briefly summarize the conditions which should lead to a suspicion of the existence of torsion of the omentum. The subject is most commonly a man of middle age, with an inguinal hernia of some years' standing, which has become troublesome and gives rise to certain symptoms which can be summed up as those of subacute intestinal obstruction. Vomiting may be absent and both feces and flatus may be passed. On examination the hernia will most probably appear to be painful and irreducible, incarcerated or strangulated. Usually a tumor can be felt both in the scrotum and on the right side of the abdomen. Should such a condition be found in the inguinal hernia of an adult woman, it will either contain an ovary and Fallopian tube or twisted omentum. Occasionally only the abdominal tumor is present, the sac appearing to be empty. Such is the clinical picture in brief, which should raise suspicions of omental torsion.

It has been stated that to Lucas-Championnière belongs the honor of being the first man to recognize two cases of torsion of the omentum. These were published separately in 1900 and 1901. In 1898, previous to his having recognized the condition, he published a case which is briefly reproduced.

Lucas-Championnière.[1] Male, aged fifty-three years. Right inguinal hernia since infancy; had worn a truss. For some time past the hernia had become more painful. On examination there was a large irreducible inguinal hernia, tender on pressure; the abdomen was hard and tender. The bowels were open. Operation:

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[1] Bull. Soc. chir., 1898, pp. 195–197.

The inguinal canal was occupied by an enormous cord continuous with a tumor in the scrotum, which was very adherent to the sac. In the centre was a little black liquid, apparently altered blood; the mass was prolonged upward into the abdomen, where it joined an enormous tumor which occupied all the anterior part of the abdominal cavity and descended into the pelvis. At the upper part it was in juxtaposition with the transverse colon and was adherent to the anterior abdominal wall. This tumor was thick, hard, lardaceous, and consisted of the entire omentum. Recovery.

This case agrees with everything which has been said of omental torsion, with the exception that the torsion must have been very slow and subacute to account for the great size of the omentum and the many adhesions which it had contracted.

Potherat in 1900, previous to his recognition of the pathological aspect of torsion of the omentum, published a case which he says was like that recorded by Championnière in 1898, which we have just reproduced. The following is a brief summary of Potherat's case.

Potherat.[1] Male, aged sixteen years. Right inguinal hernia. When first seen there was a hard, rounded tumor, obscuring the testicle; above it was a hard, irregular, thickened cord entering the inguinal canal. The patient had had slight symptoms for some months, was unable to walk, and had suffered from loss of appetite and flesh. Diagnosis: neoplasm of testicle and epididymis. Operation: Castration was performed and the cord resected high up in the canal. On examining the specimen it was found that it consisted of a mass of thickened, heaped-up omentum, which surrounded and buried the testicle; it was dark in color and resembled that described by Championnière (1898). The condition was thought to be due to inflammatory lesions affecting an old omental hernia.

Like Championnière's, this seems to have been a case of chronic torsion of the omentum; but, unlike his, the trouble appeared to be confined to the testis.

Verdelet and Rocher recorded a case in 1900 in which a hernia became irreducible, and at the operation there was found a condition in which torsion could very easily have occurred.

Verdelet and Rocher.[2] Male, aged fifty-six years. Reducible right inguinal hernia for forty years. The patient wore a truss. The hernia suddenly became irreducible without any symptoms being present; it remained irreducible for six months and was then replaced. Three weeks later, after a fit of coughing, it again became irreducible. After two days, during which taxis was repeatedly tried, the hernia was partially reduced. In the right side of the scrotum there was a soft lobulated mass, with a pedicle running up above Poupart's ligament. The tumor was not painful; it was dull on percussion, except in the upper part, where it was a little resonant. All had been reduced except a rounded mass the size of an orange, which was irregular, hard, and lobulated, but not painful on pressure. From its upper part there was a pedicle going in the direction of the inguinal canal. It was movable in the scrotum and situated behind the hernial mass. Operation: In the sac a large, fat, vascular mass was found, behind which was an irregular, lobulated, fatty tumor the size of a fetal head. There was a pedicle of the same nature, with large vessels in it, running toward the inguinal canal. There was also a right hydrocele present. The tumor was formed by the "rolling up" of the omentum on itself.

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[1] Bull. Soc. Chir., 1900, pp. 525–531.

[2] Journ. de méd. de Bordeaux, September, 1900, pp. 559–560; Gaz. hebdom. des scien. méd., June, 1900, pp. 291–293.

They describe the tumor as consisting of "rolled-up" omentum. That rolling up is not the same as twisting has not been recognized by all observers, some of whom have taken this case to be one of proved torsion. Had other symptoms than mere painless irreducibility of the hernia been present it would have been probable that torsion of the stalk above this "rolled-up" omentum had taken place. As it is, there is no evidence that torsion did occur, though it is hard to realize that it did not.

In 1902 Spellissy, in a paper on the diagnosis of appendicitis, reported a most suggestive case. Though a hernial sac was present all the signs and symptoms were intra-abdominal.

Spellissy.[1] Female, aged forty years. Right inguinal hernia for eight years. History of one day's illness, accompanied by absolute inactivity of bowels and vomiting. Diagnosis: Appendicitis. Operation: In the abdomen was found a large mass of omentum weighing about two pounds, which was in a gangrenous condition. No abscess was observed and no torsion is mentioned. The patient died on the fourth day.

This case leads up to another American one in which the symptoms were abdominal and no hernial sac was present. Although the account is not clear, some authors have included Eitel's case as one of omental torsion—*e. g.*, Scudder (48) and Noble, (45).

Eitel.[2] Male, aged forty-four years. Patient noticed the abdomen was of large size. It was tapped and three gallons of fluid drawn off. Twenty-four days later it had again become distended and two and one-half gallons were drawn off. After tapping a tumor was felt in the hypogastrium, seven inches long, four broad, and four thick, soft, movable, and neither tender nor painful on examination. Operation three days later: An omental tumor was found, rolled inward and upward, producing constriction and partial obstruction to the return circulation in it. Its veins were enormously distended. It was unravelled without difficulty and the omentum spread out; whereupon the dilatation of the veins disappeared and it became normal in appearance. The patient had been in the habit of carrying a heavy box which pressed upward and inward just below the umbilicus. No torsion above the tumor formed by the rolling up of the omentum was present.

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[1] Annals of Surgery, 1902, vol. i. p. 769.

[2] New York Medical Record, May, 1899. (Reference not confirmed.)

Again, there is the word "rolled," which renders the diagnosis of torsion difficult. This, coupled with the fact that other clinical data, such as the condition of the liver, are wanting, plus the knowledge that no other case of known omental torsion has been accompanied by such ascites, makes it unwarrantable for us to include this case.

Now, to draw attention to 4 more cases, 1 of Mr. Stephen Paget and 3 of our own. By these examples we wish to indicate the kind of case in which it seems probable that some twisting of the irreducible omentum is the cause of the pain and of the other symptoms. Any surgeon can realize how very easy it is to overlook such a turn buried deep at the root of a large omental hernia; and, owing to the absence of landmarks on the omentum itself, it is impossible to recognize even the straight position much less the slightly twisted one. The dilated condition of the veins makes it obvious that there is some pressure obstructing the blood flow in them. If this is not caused by inguinal rings it must be brought about by some change in the omentum itself. Under these circumstances torsion seems to be the most plausible explanation. Moreover, we have observed it in two cases which were very like the one just quoted.

Stephen Paget. In the College of Surgeons Museum there is a specimen (2621, A) of omentum removed in a case of supposed strangulated hernia. The following account is taken from the notes furnished with the specimen.

Male, aged sixty-three years. Right inguinal hernia for thirty-eight years. A truss had been worn. Recently the hernia came down and he was unable to replace it. Half of the tumor was returned by taxis, but a portion remained and gave a "crumbling" sensation to the hand suggestive of blood clot. The hernia increased in size. The bowels were opened; temperature normal; no vomiting; no pain. Operation: There was a thick sac containing omentum. The constriction shown in the specimen had no connection with the external ring. There was a band of omentum, arising below the constriction, adherent to the bottom of the sac. The lower half of the tumor was deep red in color.

Corner and Pinches (Case 1). W. A., male, aged twenty-five years, was admitted to St. Thomas' Hospital for a painful irreducible inguinal hernia on the left side. At the operation it was noticed that the sac contained omentum only, with some fluid; also, the omentum, though swollen, was not strangulated, and could be reduced by steady pressure without needing a "herniotomy." There was no evidence that the fluid came from the abdomen; indeed, the swollen omentum would seem to have acted as a cork and prevented it. If so, the fluid formation must have been local, in the hernia sac. Considering the extreme ease with which such a condition is overlooked during the manipulations of the operation, the case may very well have been one of torsion of the omentum.

Corner and Pinches (Case 2). W. P., male, aged forty-six years, was admitted to St. Thomas' Hospital with a painful, irreducible, right inguinal hernia. There was no vomiting. The rupture was very large. At the operation it was found to consist of an enormous mass of omentum with distended veins. More omentum was withdrawn from the abdomen, the stalk ligatured, and the mass removed. No torsion was noticed, as it was not looked for, but the stalk was certainly not strangulated.

Corner and Pinches (Case 3). F. C., male, aged forty years, was operated on for a huge, painful, and irreducible left inguinal hernia. It was found to consist of an enormous quantity of congested omentum, not strangulated, but adherent to the bottom of the sac. No torsion was noticed. But what then was the explanation of his having had painful attacks previously?

By means of these examples we hope to have shown that, from the knowledge previously gained, it has been possible to draw such inferences as are in favor or not in favor of torsion of the omentum being the key to the understanding of some clinical and pathological problems. Moreover, we hope that in such illustrations it has been possible to indicate the main directions in which our knowledge of the subject will be increased.

Differential Diagnosis. When the subject under consideration happens to be one the true clinical and pathological importance of which there is reason to believe is not yet understood, more stress must be laid upon its diagnosis or recognition at operation than upon its differential diagnosis beforehand. The concrete value of what we prefer to call the inferential diagnosis is to be placed far above the more abstract refinements of the differential diagnosis. Still, in view of the mistakes which have been made in the 53 cases collected in this paper we have thought it desirable that something should be said:

1. The instances of abdominal torsion, unaccompanied by the presence of any hernia, form about 10 to 12 per cent. of all cases of omental torsion. If the infrequency of the lesion is taken into account, as well as the fact that within the abdomen torsion is most unlikely to be overlooked, the subject of the differential diagnosis need not be considered in any detail. Five out of the six cases were diagnosed as appendicitis, with or without abscess. The sixth, occurring in Australasia, where obscure lesions are always guessed to be hydatids, was diagnosed accordingly. A tumor, or dulness with resistance, will always be present, and if found before the attack has commenced will raise other suspicions than those of

appendicitis. The condition is one which is to be recognized and treated properly during the course of operation.

2. When the torsion is in a hernial sac, 10 to 12 per cent., it will be found amongst the painful and irreducible, the incarcerated and strangulated herniæ. Here, as in the abdominal class, the surgeon should pay more attention to the recognition of the condition at operation than to its differentiation beforehand. A few words may be said upon the latter. In only two instances was bowel present, Mauclaire (47) and Makins (50). The first point to be proved will be that omentum alone is in the sac. In no case was the omentum strangulated; therefore it should have an impulse on coughing and, perhaps, bowel might be coughed down. The impulse given to an omentum hernia on coughing is far less definite than that communicated to one containing bowel. It is especially difficult to make satisfactory observations on large epiploceles which have an ample heaving impulse communicated to them by the muscles of the abdominal wall. In consequence, it is not easy to make sure of a large, non-strangulated, omental hernia. But if these two points are ascertained, then the accompanying symptoms are probably produced by torsion or epiploitis, of which two the latter is caused by the former. Beyond this the diagnosis is only a conjecture based on inference and such elementary differentiation as the above.

3. In the third division, which includes 75 to 80 per cent. of the cases, both the abdominal conditions and a hernial sac are present. The conjunction of these two enables us to take the differentiation farther than in the other classes; indeed, sufficiently far for a diagnosis rather than a conjecture to be made. Referring to what has been said above in considering the examples of abdominal and hernial torsion the signs of both will be found in the condition now under discussion. Typically, there will be present a tumor in the abdomen and an inguinal hernia, on the same side and of considerable duration (ten years), which will present signs of strangulation or irreducibility with pain. More than this, the tumor in the abdomen and the tumor in the hernia will be continuous. General symptoms of subacute peritonitis or intestinal obstruction will accompany these local signs. Such things as a local tuberculous peritonitis, an intraperitoneal abscess, pelvic cellulitis, or a subperitoneal lipoma might give rise to a somewhat similar state of affairs. But it is of interest to note that the majority of the diagnoses made concerned the hernial condition, *e. g.* strangulated epiplocele; and when the abdominal signs predominated, appendicitis was suspected. If the above signs and symptoms are found, and special attention given to the diagnoses which learned and competent observers have already made in examples of omental torsion, it should be possible to arrive with reasonable certainty at a diagnosis. There is some practical importance in this, because

it may be necessary to open the abdomen as well as the hernial sac. Demons' case (2) died, most probably because this was not done at first. Rectal examinations have never revealed anything in these cases and therefore will give very useful help in differentiation, *e. g.*, appendix abscess or pelvic cellulitis.

Strangulated inguinal herniæ are very infrequent in women; yet a relatively high percentage of cases of omental torsion, connected with a hernia, occurred in women. In middle-aged women one must always remember that the Fallopian tubes and ovaries, usually in an abnormal condition, are found in these herniæ. A rectal or vaginal examination enables one to make the distinction at once.

As omental torsion has never been found in a femoral hernia, the differentiation of it from a partial enterocele (Richter's hernia) need not be discussed.

In a certain number of cases the hernia has been reduced without relief of the symptoms, although the sac is empty. In these cases the obvious diagnosis of reduction without relief of the strangulation, or, as it is called, reduction *en masse,* is made, and nothing more can be inferred. Further, in a few more instances the attack or crisis came on while the hernial sac was empty, as in Peck's (7) and Noble's (45) cases. In these there is no guide to the fact that the case is not one of appendicitis; but as there had been a hernia of considerable duration present, the suspicion of omental torsion might arise.

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CONGENITAL TRICUSPID STENOSIS COMPLICATED BY MITRAL STENOSIS.[1]

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The following instructive case recently came under my observation in my private course on physical diagnosis at the Metropolitan Hospital, New York City, and being one of rare occurrence I report the same in full:

S. S., admitted to the Metropolitan Hospital, New York City, September 13, 1904; Austrian, aged twenty-eight years; single; occupation, housework; height, 5 feet 6 inches; weight, 128 pounds.

Family history negative.

Birth natural. No instruments employed. Reared on the breast.

At six years of age had measles. She cannot recall any other illness in her life Upon this point she was most carefully interrogated. (Note questions under remarks at end of this article.)

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[1] Read before the New York Pathological Society, January 11, 1905.